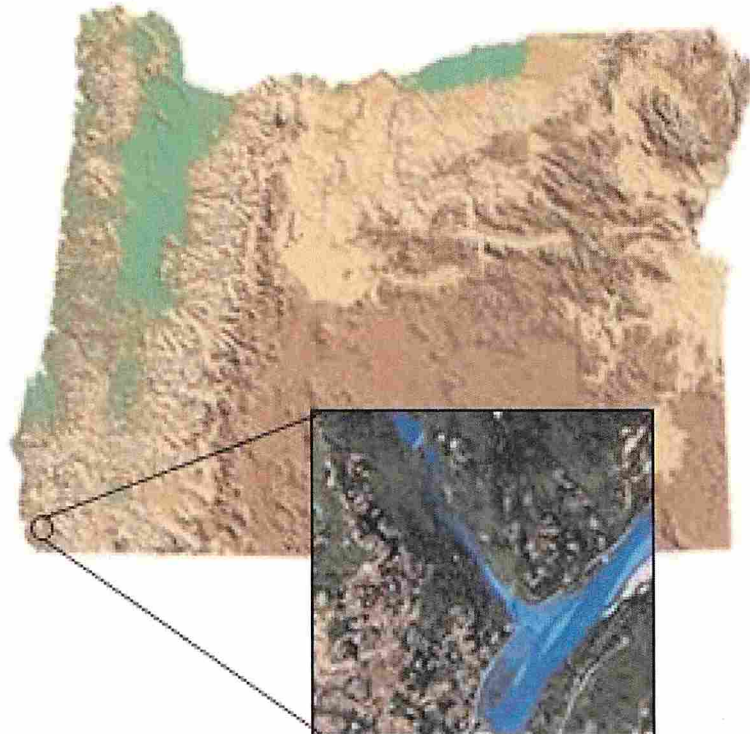


Emergency Action Plan Ferry Creek Dam (OR00437)

Brookings, OR



Prepared For
City of Brookings, Dam Owner

2/2/2017

Emergency Notifications and Message

Urgent – dam failure -flooding is imminent or in progress

Call 9-1-1

Message: I am reporting an emergency at Ferry Creek Dam near the City of Brookings. This is [name and position] with the City of Brookings. This is an urgent emergency, the dam is failing and a dam breach flood will occur. People are in danger and need to evacuate. Please implement the emergency action plan. I am at [location] and can be reached at [phone number] after you have made emergency notifications. Refer to Page 11 in the EAP for additional detail on notifications.

Stay on the phone with the 9-1-1 operator until you both agree necessary information has been exchanged and the emergency response effectively initiated.

Potential dam failure situation is rapidly developing

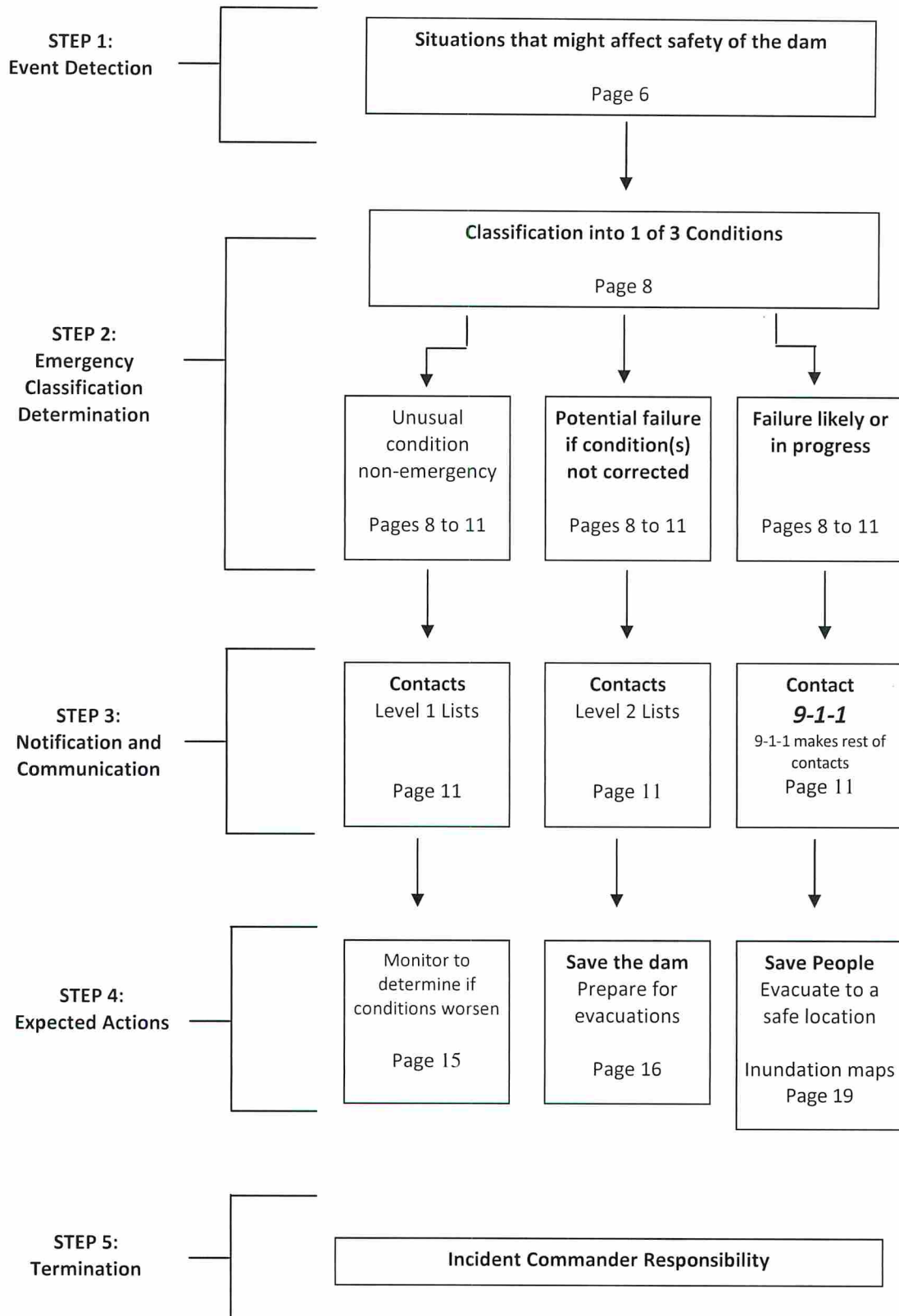
Dam owner or representative - Call 9-1-1

Message: I am reporting an emergency at Ferry Creek Dam near the City of Brookings. This is [name and position] with the City of Brookings. At this time it is a potential dam failure emergency. Please inform the Curry County Emergency Services Coordinator, and make other emergency contacts as necessary to prepare for possible evacuations. I am at [location] and can be reached at [phone number]. We are taking emergency actions to save the dam, and will contact the State Dam Safety Engineer and our engineer for technical advice on preventing dam failure. Refer to Page 11 in the EAP for additional detail on notifications.

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Section 1) EAP Overview



Section 2) Basic EAP Data

Purpose: This EAP contains pre-planned actions to reduce the risk of human life loss and injury and minimize property damage during an emergency event at Ferry Creek dam. It allows people with limited dam familiarity to act decisively during an unusual or emergency situation.

Dam Description:

Ferry Creek dam is an earthen fill dam built in the late 1960's. It has not been used as a water supply dam in many years. There are multiple dam safety issues with this dam. These issues are as follows:

1. Insufficient capacity of the emergency spillway
2. Low spots on the crest that reduce minimum freeboard
3. Area around the dam is prone to landslides
4. Slope movement next to emergency spillway channel causing overturning of the concrete channel retaining wall.
5. Seismic instability, the dam will likely not survive a major earthquake
6. Multiple penetrating conduits through the dam that are not operable

Potential Impacted Area

See Inundation Map on page 19 for the locations that may be flooded if the dam should fail. The inundation area includes several buildings, including two houses, to the northwest of North Bank Chetco River Road, approximately one mile from HWY 101. Note, if a dam breach occurs, it may take as little as a few minutes for these homes to be inundated by the flood wave.

Directions to dam

From Brookings City Hall and Emergency Operations Center, 898 & 888 Elk Drive:

Take Ross Road or 5th Street south to Chetco Avenue / Highway 101.

Left on Chetco Avenue / Highway 101 for 0.7 miles

Left on North Bank Chetco River Road for 400 feet

Left on Old County Road for 0.5 miles

Right on Marine Drive for 1.1 miles

Note: Marine Drive proper terminates and the route to the dam continues, through a locked gate, on an easement through private property.

Dam Information:

Height: 52 feet	Drainage Area: 0.56 square miles
Built: 1960's	Hazard Classification: High
Legal Description: Section 32, Town. 40S, Range 13W	Storage: 167 ac-ft
Latitude: 42.07373809 Longitude: -124.27144622	National Inventory of Dams Number: OR00437

Section 3) Roles and Responsibilities

City of Brookings - Dam Owner

1. As soon as an emergency event is observed or reported, immediately determine the emergency classification as described in pages 8 to 11.
2. Make notifications as shown on pages 11 to 15.
3. Monitor dam for changing conditions, and take all actions to save the dam if potential failure situation exists.
4. Provide updates of conditions that could cause dam failure to the Incident Commander or 9-1-1 dispatcher to assist them in making timely and accurate decisions regarding warnings and evacuations.
5. Provide leadership to assure the EAP is reviewed and updated as needed and copies of the revised EAP are distributed to all who received copies of the original EAP.

John Ward (Sheriff), Curry County Sheriff's Office - Incident Commander

1. Serve as the primary contact person responsible for coordination of all emergency actions. Select an alternate emergency manager for situations where the planned Incident Commander is not available.
2. Review the inundation map, and determine if an evacuation map based on this inundation map is needed. An evacuation map should indicate what areas will be evacuated, and what agency is responsible for evacuation.
3. Determine roles and responsibilities of local agencies.
4. When a **potential dam failure** emergency occurs, prepare emergency management personnel for possible evacuations that may be needed if a failure is imminent or occurs.
5. When a **failure in progress** emergency occurs, initiate warnings and organize evacuations.
6. Notify local emergency management services to carry out the evacuation of people and close roads within the evacuation area (see Inundation Map, Section 5).
7. Decide when to terminate the emergency actions.
8. Participate in review and updates of the EAP.

Local Emergency Management Agencies

1. Review the inundation map and prioritize the potential evacuation efforts prior to an emergency situation.
2. When a potential failure situation occurs:
 - a. Prepare emergency management personnel for possible evacuations that may be needed if an Urgent failure situation occurs.
 - b. Alert public as appropriate
3. When an Urgent failure occurs:

- a. Coordinate with the Curry County Sheriff, Oregon State Police, and Brookings Fire and Rescue to safely evacuate people at risk downstream of the dam.
4. Notify Curry County Emergency Manager to carry out the evacuation of people and close roads within the evacuation area (see Inundation Map, Section 9.0).
5. Decide when to terminate the emergency actions.
6. Participate in review and updates of the EAP.

Oregon Dam Safety Engineer and/or Dam Owners Engineer

1. Assist dam owner in determination of emergency classification.
2. Notify the Oregon Emergency Response System (OERS) of potential dam failure emergency, and consult with OERS on scope of emergency for potential, imminent and dam failure emergencies.
3. Advise the dam owner on appropriate actions that can save the dam (potential failure).
4. Provide technical information to the dam owner and incident commander (imminent failure).
5. Conduct a forensic investigation of the dam failure.

Oregon Emergency Response System (OERS)

1. Complete notifications by emergency classification as shown on Pages 11 to 15.
2. Open the Emergency Operations Center when needed.
3. Advise the Governor on State Emergency Declarations and State resources needed.
4. Direct internal and other agency staff during a State Emergency.

Section 4) Five Step EAP Process

There are five critical steps to successful and implementation of the emergency action plan. These steps are summarized below and covered in detail on the following pages.

- Step 1 Event Detection – Dam specific modes of failure [Pages 6]
- Step 2 Emergency Classification Determinations [Pages 8]
- Step 3 Notifications and Communication [Pages 11]
- Step 4 Expected Actions [Pages 15]
- Step 5 Termination [Pages 18]

Step 1 - Event Detection: Reasonably Possible Modes of Dam Failure

This step provides dam specific indicators of a possible emergency at Ferry Creek Dam. Unusual or emergency events may be detected by:

- Observations at or near the dam by government personnel (local, state, or Federal), landowners, visitors to the dam, or the public;
- Unusual events, especially flash floods or earthquakes; and

Pre-existing conditions on this dam: There are multiple special condition(s) known at this dam that might lead to an emergency.

1. Insufficient capacity of the emergency spillway
2. Low spots on the crest that reduce minimum freeboard
3. Slope movement next to emergency spillway channel causing overturning of the concrete channel retaining wall.
4. Seismic instability, the dam will likely not survive a major earthquake
5. Multiple penetrating conduits through the dam that are not operable

A dam emergency may exist if there is any actual or anticipated flow of water in a location where it has not and should not occur. Emergencies may also exist if there is cracking or slope movement, or structural damage.

The most realistic modes of failure are classified as follows:

- A. Flood overtopping or dam overfilling
- B. Embankment or reservoir movement
- C. Leakage and internal erosion
- D. Other structural damage.

The text that follows provides very general information on conditions that might indicate an Emergency. If any of these unusual conditions are detected, immediately proceed to Step 2 to determine the emergency classification. More detail on these is found under Step 2. The reasonably expected conditions are as follows.

A. Flooding or overfilling

Water flowing over the top of dams causes the most serious failures of earthen dams. High flows can also cause severe erosion and headcutting of the spillway, which if uncontrolled will lead to a dam breach. Observations of water level compared to the crest of the dam are essential for detecting flooding or overfilling. Flash flood warnings may be used to determine when extra observations are needed. The standard freeboard or water level for this dam is *less than 3 feet*. If water is rapidly approaching the dam crest, or flowing over the crest, information on emergency classification is found in the following section.

B. Embankment or reservoir movement

New and extensive or lengthy cracks (those not caused by drying) indicate dam movement or settlement. Actual visible movement of a portion of the dam is even more serious. Movement of a landslide above the dam or a large landslide actively moving above the reservoir can damage the dam or cause a large volume of water to flow over the dam. It is very important to actively inspect the dam for signs of movement after intense earthquake shaking or a long duration flood event.

C. Leakage and internal erosion

A small volume of clear seepage is common on most earthen dams. Although no seepage has been observed on this dam, due to the unknown condition of the multiple penetrating conduits, the occurrence of seepage is a possibility. An increase in seepage or a new area of seepage can sometimes be an indicator of a more serious problem. If there is muddy seepage this often indicates internal erosion of the dam, and is very serious. Sinkholes in the dam or whirlpools in the reservoir next to the dam can also indicate dam safety problems.

D. Other structural damage

Any structural damage that restricts releases of water from the dam might constitute an emergency. This may include but is not limited to: A nonfunctional regulatory outlet valve; slab buckling of a concrete spillway exposing erodible materials or allowing flow under the concrete; or spillway retaining wall overturning and collapse.

If these conditions are present, detail on determining whether it is an actual Emergency, and the emergency classification, is found under Step 2.

Note that damage to concrete portions of the dam is not uncommon after a major earthquake. If such damage is identified, and will prevent safe passage of flood flows, it should be evaluated for emergency classification determination in the following step.

Even if an event is not listed above, any atypical situation that is or poses risk of flooding downstream as a result of the dam is a potential emergency situation. Normal and safe passage of flood waters (where flow is not increased as a result of the dam) are not emergency situations.

Step 2 - Emergency Classification Determinations

After an unusual or emergency event is detected or reported, the Dam owner or representative is responsible for classifying the event into one of **3 (three) emergency classifications**. As the emergency classification increases, the seriousness of the emergency also increases as summarized below.

Emergency Level 1 - Nonemergency - unusual event - slowly developing – inspect and monitor

Emergency Level 2 - Potential dam failure situation - rapidly developing – save dam

Emergency Level 3 - Urgent - dam failure imminent or in progress –save people

A non-emergency is an unusual condition that warrants inspection and monitoring for changes. A potential dam failure exists when conditions affecting dam safety are rapidly changing and emergency actions, including repair, are essential. It is also essential that emergency managers are notified so that they can prepare if the situation worsens and evacuations are needed. However, the dam is not at imminent risk of failure (hours). For unusual conditions and potential failure conditions, the dam owner should consult with the State Dam Safety Engineer and the owner's engineer as needed to determine the appropriate emergency classification, if any.

For an imminent failure condition the priority is to notify 9-1-1 in order to save lives. Actions at the dam under an imminent failure condition should be to protect persons on site, delay the flood if possible, and inform emergency managers on status of flooding at the dam. Guidance to determine emergency classification is organized the same way as emergency detection in step 1. The following criteria are guidelines, since actual failure situations are unique.

A. Flooding or Overfilling

A Flash Flood warning has been issued by NWS for this specific location, or the river is forecast to hit major flood stage, and the reservoir pool is full or nearly full.

A.1 Unusual Condition – Emergency Level 1 Indicators

- The primary spillway is obstructed.
- The reservoir water level is above minimum freeboard 3 feet (*below dam crest*).

A.1 Potential Failure– Emergency Level 2 Indicators

- The reservoir level is *one (1)* foot below the dam crest and rising.
- The reservoir level is at the crest of the dam, but is not rising, and there is no embankment erosion observed.
- Headcutting of spillway is actively occurring, moving rapidly towards the reservoir

A.3 Imminent Failure -- Emergency Level 3 Indicators

- A dam breach is occurring and flows are rapidly increasing.
- The reservoir level is at crest of the dam and rising rapidly.
- Water is flowing over dam crest, onto and eroding the embankment.
- The concrete spillway has failed and flood flows are rapidly eroding embankment materials.
- Severe headcutting in spillway is within twenty (20) feet of the reservoir and visible progression towards dam is observed while on site.

B. Embankment or Reservoir Rim Movement

B.1 Unusual Condition– Emergency Level 1 Indicators

- New cracks not associated with drying are observed, there is no seepage through the cracks, and the measurable crack gap is less than *1 inch*.
- A small, shallow and isolated landslide occurs on the downstream face of the dam.

B.2 Potential Failure– Emergency Level 2 Indicators

- New cracks are observed, with reservoir leakage or offset over *[1]* inch.
- A new crack is observed that causes a crest drop of over *2 inches*.
- A deep landslide moves part of the embankment but does not extend into upstream slope of dam.
- There is observable movement of a large landslide (*over ¼ acre*) on natural slopes above dam.

B.3 Imminent Failure Indicators – Emergency Level 3 Indicators

- A deep landslide moves part of the embankment and extends into upstream slope of dam to the water level.
- There are multiple landslides on the embankment with continued movement.

- Rapidly increasing and muddy leakage is observed through cracks that extend below water level.
- There is any embankment or reservoir slope movement that results in continuous water flow over the crest of dam.

C. Leakage and Internal Erosion

C.1 Unusual Condition– Emergency Level 1 Indicators

- A never before observed seep location in the downstream face or abutment of the dam is identified.
- There is a noticeable increase flow at an existing seep or drain over a period of a week or less that is not related to or justified by high reservoir levels.
- There is a small and clear leak through animal hole or root hole (*less than 20 gallons per minute*).
- Deposits of material likely eroded from the dam are observed at seepage locations or below internal drain pipes, with clear drainage water.

C.2 Potential Failure– Emergency Level 2 Indicators

- Rapidly increasing seepage is observed and measured (*doubling in a week or less*).
- There is rapid leakage through the dam (*over 1-5 cfs*).
- There is muddy seepage coming directly out of the dam.
- There is a new sinkhole (*2 foot diameter and over 6 inches deep*).
- A whirlpool is observed in the reservoir near the dam A boil (water upwelling with critical hydraulic gradient) is observed in the dam, or just below the dam.
- The reservoir level is falling without apparent cause.

C.3 Imminent Failure – Emergency Level 3 Indicators

- Internal piping/erosion in the dam is observed, is still occurring, and flow exceeds *10 cfs*.
- There is a sinkhole over 3 feet in diameter in the dam, and the sinkhole is getting larger over a period of a day or less.
- A sinkhole or pipe has caused drop in a portion of dam crest.
- There is any internal erosion causing crest drop and water to flow over crest of dam.

D. Other Structural damage

D.1 Unusual Condition– Emergency Level 1 Indicators

- The primary outlet for dam is not functional
- There is a moderate earthquake (*Richter Magnitude 5.0 or greater*) close to dam, or major subduction zone earthquake for any dam in western Oregon.

D.2 Potential Failure– Emergency Level 2 Indicators

- Cracking of a concrete spillway is observed and dam embankment material is exposed.
- *The low level conduit valves are not functional, the pool is near full and additional runoff is likely.*

D.3 Imminent Failure– Emergency Level 3 Indicators

- *A major earthquake causes Mercalli Intensity [5, 6, 7, 8] shaking at the dam. This is a special dam failure emergency condition. Please contact the dam safety engineering if this applies to your dam.*
- Rapidly increasing flow is observed at a leak through a concrete dam.
- There is any other damage that causes water to flow over the crest and erode dam.

Step 3 - Notifications and Communication

After the emergency classification has been determined, essential notifications shall be made immediately.

Emergency Level 1: Situation is slowly developing and does not pose a near term risk of dam failure. When present, the dam owner should contact OWRD and their engineer. The owner should describe the situation, and request technical assistance on next steps to take. Notification detail follows.

If an outside observer or any official notices or is notified of an unusual condition, the initial contact is to the Dam Owner, City of Brookings dispatch, 541-469-3118.

Contacts for Emergency Level 1

Contacts by Dam Owner

1 –Keith Mills, State Engineer:

- Office Phone Number: (503) 986-0840
- Cell Phone Number: (541) 706-0849 (24-hour)

2 – Steve Major, The Dyer Partnership:

Office: 541.267.0732

The dam owner should consult with the engineer(s) above to confirm emergency classification.

Emergency Level 2: Is a situation that has or is rapidly developing, and has the potential to progress to a dam failure. However, dam failure is not imminent.

If an outside observer or any official notices or is notified of an unusual condition, the initial contact is to the Dam Owner *[name at phone number]*.

Emergency Level 2 Contacts

Contacts by Dam Owner

- # 1 - 9-1-1 or Incident Commander
- # 2 - State Engineer
- # 3 - Dam owners' engineer and personnel
- # 4 - Specialists and Heavy Equipment Operators as needed

Contacts by State Engineer

- # 1 – Oregon Emergency Response System (OERS)

Emergency Level 2 Message

Potential dam failure situation is rapidly developing
<p>Dam owner or representative - Call 9-1-1</p> <p>Message: I am reporting an emergency at Ferry Creek Dam near the City of Brookings. This is [name and position] with the City of Brookings. At this time it is a potential dam failure emergency. Please inform the Curry County Emergency Services Coordinator, and make other emergency contacts as necessary to prepare for possible evacuations. I am at [location] and can be reached at [phone number]. We are taking emergency actions to save the dam, and will contact the State Dam Safety Engineer and our engineer for technical advice on preventing dam failure. Refer to Page 11 in the EAP for additional detail on notifications.</p>

Emergency Level 3: A dam breach or dangerous flooding is occurring or imminent. If an outside observer or any official notices or is notified of a dam failure in progress, **call 9-1-1**.

If the dam owner observes a dam failure in progress, the only contact for the dam owner is 9-1-1. The exception is if the dam owner is directly responsible for notifications to persons immediately below the dam who need to evacuate and cannot be effectively reached by other means.

Emergency Level 3 Contacts

Contacts by 9-1-1 dispatcher (they will maintain contact phone numbers)

- # 1 - Incident Commander
- # 2 - Other Counties where evacuations needed by the County
- # 3 - Affected Cities where evacuations needed by the City (list each)
- # 4 - Oregon Office Emergency Response System (OERS)

Contacts by Oregon Emergency Response Center

- # 1 - National Weather Service (for flash flood watch or warning)
- # 2 - Oregon State Police
- # 3 - Oregon Water Resource Department State Engineer
- # 4 - OERS Council Members and other notifications based on scope of Emergency

Emergency Level 3 Message

Urgent – dam failure -flooding is imminent or in progress

Call 9-1-1

Message: I am reporting an emergency at Ferry Creek Dam near the City of Brookings. This is [name and position] with the City of Brookings. This is an urgent emergency, the dam is failing and a dam breach flood will occur. People are in danger and need to evacuate. Please implement the emergency action plan. I am at [location] and can be reached at [phone number] after you have made emergency notifications. Refer to Page 11 in the EAP for additional detail on notifications.

Stay on the phone with the 9-1-1 operator until you both agree necessary information has been exchanged and the emergency response effectively initiated.

After emergency contacts are made by the 9-1-1 dispatcher, let them know you will advise them when the situation is resolved or if the situation gets worse. Fill out the contacts and events log as time permits.

Emergency Services Contacts

Agency / Organization	Principal contact	Office telephone number	Alternate telephone numbers	Alternate Contact
Lead representative for dam owner	Gary Milliman	541.469.1101	541.823.9267	
Alternate dam owner representative	Paul Stevens	541.469.1131		
Lead Emergency Manager/ Incident Commander	Don Kendall Curry EM	541.247.3208		
Alternate Incident Commander	John Ward Sheriff	541.247.3242		
Dam Operator/ditch runner				
City 1 Emergency Manager	Chris Wallace Public Safety Dir.	541.469.1190		
City 2 Emergency Manager	Jim Watson Fire Chief	541.469.1142		
OWRD state Engineer	Keith Mills	(503) 986-0840	(541) 706-0849	OWRD Dam Safety Engineer
National Weather Service	Ryan Sandler	541.776.4303 #223		
Oregon Emergency Response System (OERS)	24 hour contact	(800) 452-0311		
Dam owners engineer	Steve Major	541.469.0732		
OWRD Dam Safety Engineer	Tony Janicek	(503) 986-0839		
Local News Media				

Step 4 - Expected Actions

After determining the emergency classification and making initial notifications, the dam owner is expected to take all necessary and safe actions to protect the dam. If a citizen calls 911 and reports observations of an unusual or emergency event at the dam, 9-1-1 will immediately contact the dam owner. The dam owner will determine if there is an emergency. If there is an emergency, the owner will consult engineers as time permits to determine the emergency classification.

The dam owner is responsible for directing all actions under non failure condition, as follow.

Nonemergency, unusual event; slowly developing

The dam owner and or an engineer will inspect the dam. The dam owner will ensure the dam is monitored and repaired as needed and possible to prevent the emergency from becoming more serious. In many cases, it will be necessary to safely release water from the dam. However, the low level conduits of Ferry Creek Dam are not operational and cannot release water from the dam. As a result, pumps or siphons should be used to lower the level of the reservoir. **If conditions become more serious in a short time, the emergency classification should be increased.**

Potential dam failure situation; rapidly developing

At this point the two priorities are 1) to prepare for evacuation and 2) emergency repair to save dam. The dam owner will call the OWRD State Engineer and their engineer. As available, one or both will make every effort to get to the dam site to inspect the dam, investigate the situation, and recommend corrective actions.

The dam owner will contact the incident commander to inform him/her that the EAP has been activated and if current conditions get worse, an emergency situation may require evacuation. Preparations should be made for possible road closures and evacuations. The dam owner or representative will update the incident commander as conditions at the dam change.

The dam owner will order materials, equipment and supplies that are needed and likely to save the dam. See *Resources Available* (Appendix) for sources of equipment and materials to assist with dam saving actions. The following actions should be applied as needed for potential dam failure conditions. Close monitoring of the dam must be maintained to confirm the success of any remedial action taken at the dam. **The dam owner is responsible for actions to save the dam, which may include:**

ACTIONS TO SAVE THE DAM

For almost all emergency situations, the following actions will be needed

1. Release water from the dam. The low level conduits of Ferry Creek Dam are not operational and cannot release water from the dam. As a result, pumps or siphons will be needed to lower the level of the reservoir.
2. Increase the crest height using sandbags or a sand tube *if* water is likely to flow over the crest.
3. Cover the weak areas of the top of the dam and downstream slope with riprap or gravel as available.

The exception to the actions above is for damage or leakage from a conduit, where opening the conduit may cause additional dam distress.

Additional actions by type of emergency follow.

A.2 Flood overtopping or dam overfilling

1. Remove material blocking the spillway, including any debris or vegetation.
2. Place rip rap into a headcut in the spillway.

B.2 Embankment or reservoir movement

1. Direct water away from cracks by any safe means possible.
2. Restore freeboard by fill placement in consultation with engineer.
3. Stabilize slides as directed by a geotechnical engineer.

C.2 Leakage and internal erosion

1. If a whirlpool or other seepage entry point is observed, reduce the flow by plugging the entrance with rip rap if available, or anything large like hay bales if rip rap not available or effective.
2. Cover the seepage exit area(s) with an emergency filter. A typical emergency filter is one foot of concrete mix sand on the seepage area (as long as most of it does not wash away), then one foot of crushed rock gravel over the sand, and then rip rap over the gravel until the flow volume significantly decreases or at minimum stops increasing, or it becomes unsafe to work at this location.
3. Construct sandbag or other types of ring dikes around seepage exit areas to retain a pool of water, providing backpressure and reducing the erosive nature of the seepage.
4. Dump sandbags onto boils or leaks

5. Keep vehicles and equipment downstream from the area of leakage to avoid potential loss from the collapse of an underground void. Equipment may work from the crest if it is not dropping or otherwise hazardous.

D.2 Other structural damage

1. Follow advice of a qualified engineer

Dam Failure Imminent or Occurring

Urgent; dam failure appears imminent or is in progress: At this classification, the necessary actions are protecting people. This is an emergency manager responsibility.

Note if a dam breach occurs, it may take as little as a few minutes for the homes in the inundation zone below the dam to be inundated by the flood wave.

The Incident Commander shall lead actions to efficiently evacuate people to safe locations. All assisting first responders need to be advised on the situation and their role. This includes warnings, closing roads, and directly notifying people at risk downstream from the dam (see Inundation Maps, Section 5).

The 9-1-1 dispatcher shall notify all agencies and officials on the list

The National Weather Service shall issue watches and warnings as appropriate. A watch is normally appropriate for a potential dam failure, and a warning is normally appropriate for an imminent or actual dam failure emergency.

The Incident Commander will decide how to contact news media. **All news media requests should be directed to the incident commander or if the IC has appointed one, the Information Officer.**

Earthquake caused failure likely – The [Curry Alert System](#) will be used for alerting residents.

Step 5 - Termination

Whenever the EAP has been activated **and a dam failure emergency declared**, the Incident Commander will determine when the emergency is over based on actual conditions. The Incident Commander will relay this decision to the dam owner and other Emergency Responders. The 9-1-1 dispatcher shall contact OERS to inform them the emergency has been terminated.

Prior to termination of a dam failure event that has not caused actual dam failure, the State Dam Safety Engineer will inspect the dam or require the inspection of the dam to determine whether any damage has occurred that could potentially result in loss of life, injury, or property damage. If it is determined conditions do not pose a threat to people or property, the Incident Commander will be advised to terminate EAP operations as described above.

Prior to Termination of a potential failure emergency, the State Dam Safety Engineer should be consulted. A non failure condition may be terminated when conditions return to normal, or after an engineer determines that the unusual conditions pose no dam safety risk.

Section 5) Inundation Maps

- Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl
Projection: Lambert Conformal Conic
Datum: North American 1983

Legend

2ft Depth

0

0.0175

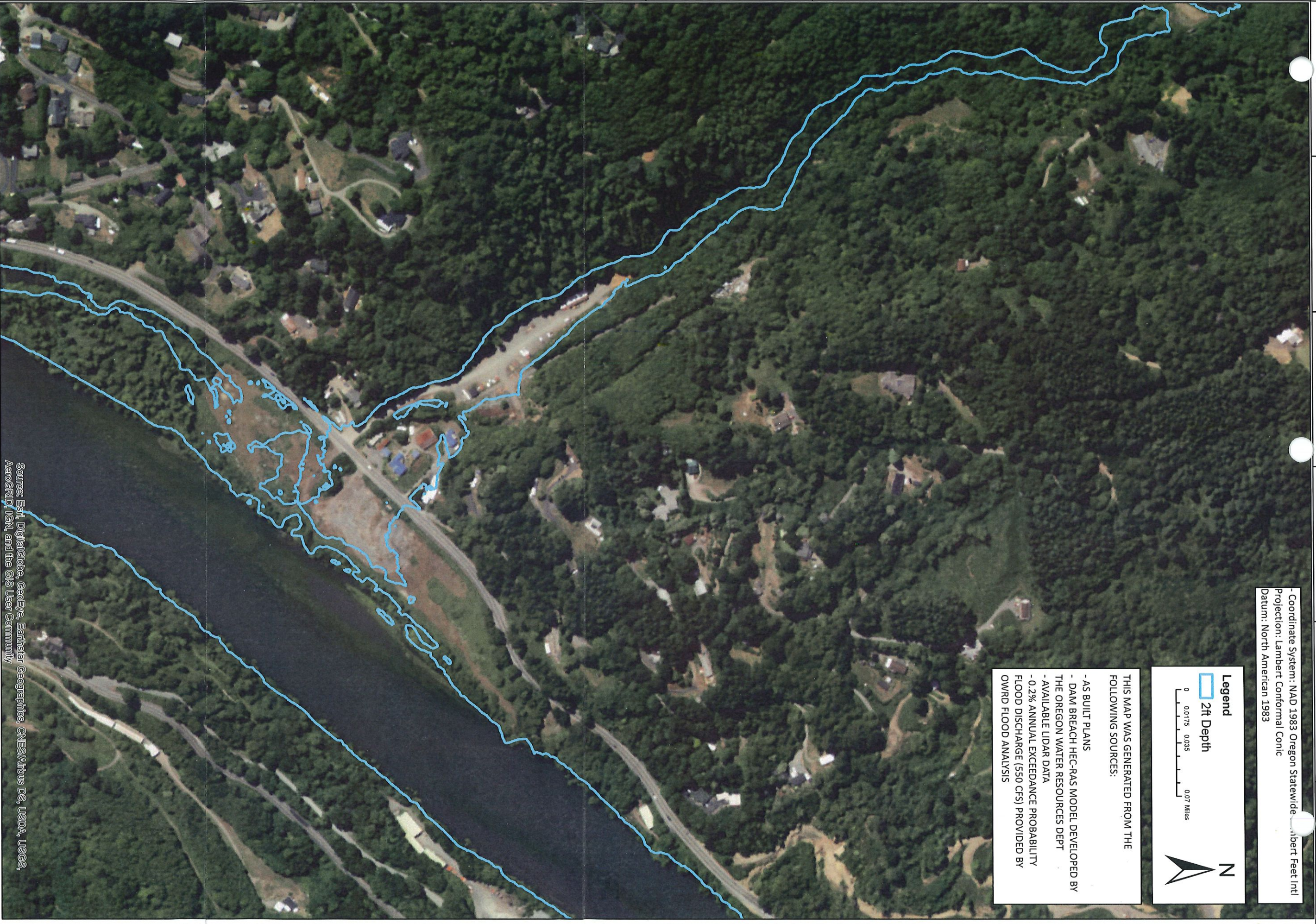
0.035

0.07 Miles

N

THIS MAP WAS GENERATED FROM THE FOLLOWING SOURCES:

- AS BUILT PLANS
- DAM BREACH HEC-RAS MODEL DEVELOPED BY THE OREGON WATER RESOURCES DEPT
- AVAILABLE LIDAR DATA
- 0.2% ANNUAL EXCEEDANCE PROBABILITY FLOOD DISCHARGE (550 CFS) PROVIDED BY OWRD FLOOD ANALYSIS



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

DRAWING NO: 1 of 1		FERRY CREEK DAM CURRY COUNTY OREGON DAM BREACH INUNDATION MAP		OREGON WATER RESOURCES DEPARTMENT DAM SAFETY 725 SUMMER ST SUITE A SALEM, OR 97301		Drawn by: 7/21/2017		Designed by:		<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																																																																																																						<table><tr><td>Revision</td><td>Date</td><td>Description</td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></table>		Revision	Date	Description																																
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Appendix A–1 Resources Available

Excavation Services						
Company	Phone	Cel or Alt	Make/Model	Bucket/HP	Accessories	Per Hour
Tidewater Contractors	541.469.5341					
Sand and gravel Supply						
Company	Phone	Cel or Alt	Make/Model	Buckets	Address	
Tidewater Contractors	541.469.5341					
Specialist Engineer						
Company	Phone	Cel or Alt	Make Model	Buckets	Accessories	Per Hour
Geotechnical Resources	503.641.3478					160
Sand bags or Sand Tubes						
Company	Phone	Cel or Alt	Make Model	Buckets	Accessories	Per Hour
Tidewater Contractors	541.641.3478					
Special grouts and cement suppliers						
Company	Phone	Cel or Alt	Make Model	Buckets	Accessories	Per Hour
Tidewater Contractors	541.641.3478					
Ready Mix-Concrete						
Company	Phone	Cel or Alt	Make/Model	Buckets	Accessories	
Tidewater Contractors	541.641.3478					
Pumps						
Company	Phone	Make/Model		General Exp		Auto Exp
Tidewater Contractors	541.641.3478					

Appendix A-2 Maintenance—EAP Review and Revision

EAP annual review

The City will review and, if needed, update the EAP at least once each year. The EAP annual review will include the following:

- Calling all contacts on the three notification charts in the EAP to verify that the phone numbers and persons in the specified positions are current. The EAP will be revised if any of the contacts have changed.
- Contacting the local law enforcement agency to verify the phone numbers and persons in the specified positions. In addition, the City will ask if the person contacted knows where the EAP is kept and if responsibilities described in the EAP are understood.
- Calling the locally available resources to verify that the phone numbers, addresses, and services are current.

Revisions

The City is responsible for updating the EAP document. The EAP document held by the City is the master document. When the annual revisions occur, the City will provide the revised pages and a revised revision summary page to all the EAP document holders. The document holders are responsible for revising the outdated copy of the respective document(s) whenever revisions are received. Outdated pages shall be immediately discarded to avoid any confusion with the revisions.

EAP periodic exercise

The City will host and facilitate a periodic test of the EAP at least once every 2 years.

The periodic test will consist of a meeting, including a tabletop exercise, conducted at the City Public Works Department office. Attendance should include the Public Works Superintendent, key City staff members, at least one representative of the local law enforcement agency, and others with key responsibilities listed in the EAP. At the discretion of the City, other organizations that may be involved with an unusual or emergency event at the dam are encouraged to participate. Before the tabletop exercise begins, meeting participants will visit the dam during the periodic test to familiarize themselves with the dam site.

The tabletop exercise will begin with the facilitator presenting a scenario of an unusual or emergency event at the dam. The scenario will be developed prior to the exercise. Once the scenario has been presented, the participants will discuss the responses and actions that they would take to address and resolve the scenario. The narrator will control the discussion, ensuring realistic responses and developing the scenario throughout the exercise. The Public Works Superintendent should complete an event log as they would during an actual event.

After the tabletop exercise, the five sections of the EAP will be reviewed and discussed. Mutual aid agreements and other emergency procedures can be discussed. The City will prepare a written summary of the periodic test and revise the EAP, as necessary.

Appendix A–3 Log of Events

(to be completed during the emergency, start a new form if emergency classification changes)

Dam name: _____

County: _____

Emergency Condition: Flood/overtop Internal Erosion Movement Structural

When and how was the event detected? _____

Recent weather conditions: _____

General description of the emergency situation: _____

Emergency classification ____

Actions and Event Progression

Date	Time	Measurement/water level/crack width/etc.	Action/event progression - taken by

Report prepared by: _____ Date: _____

Appendix B-1 Record of Holders of Control Copies

Copy Number	Organization	Person receiving copy
1	Oregon Water Resources Department 725 Summer Street NE Suite A, Salem OR 97301	Keith Mills State Engineer
2		
3		
4		
5		
6		
7		
8		

Appendix B-2 Residents/Businesses/Highways at Risk

A major flood caused by a sudden breach of the dam is estimated to inundate _____, homes, _____, businesses, and _____, highways. These homes and businesses (marked on the evacuation map) are located _____.

House/ business no.*	Resident/business	Address	Phone no.	Distance downstream from dam (ft)	Travel time* (hr)	Max water depth above first floor (ft)
	Patricia Curry (Trstee)	97825 N. Bank Chetco River Rd.		2200'	0	∞
	Michael & Janett Manning	17064 Ferry Crk Hgts		1100'	0	∞
	Charles & Amelia Arneson	97821 N Bank Chetco River Rd		3000'		
	Edward & Larri Powers	97781 N Bank Chetco River Rd		3000'		
	Patrick Murray	97773 N Bank Chetco River Rd		3000'		
	John & Randi Darger	97761 N Bank Chetco River Rd		3200'		
	Patrica Curry	97829 N Bank Chetco River Rd		3000'		
	Clare & King Price	97831 N Bank Chetco River Rd		3000'		
		97839 N Bank Chetco River Rd		3000'		
		97926 N Bank Chetco River Rd		3000'		
		97845 N Bank Chetco River Rd		3000'		

* See Appendix B-4.

** Estimated time for breach wave (peak) to travel from dam to downstream locations